
# Ultima® X Series Gas Monitors

[Ultimate Features. . . EXtreme Design ]

Featuring X3™ Technology

ULTIMA X SERIES GAS MONITORS

MSA

# Ultima® X Series Gas Monitors

*MSA's Ultima X Series Gas Monitors are microprocessor-based transmitters, engineered with the customer in mind.*

The latest mechanical and electrical technologies offer a state-of-the-art design for any gas detection need. The Ultima X Series Gas Monitors, available in both stainless steel and polycarbonate enclosure housings, provide continuous monitoring of hazardous gases.

Advanced sensing technologies monitor against the threat of combustible and toxic gases and for oxygen deficiency, utilizing catalytic, electrochemical and infrared gas detection methods.

## Installation and Operation

Installation is both simple and flexible. The Ultima X Series Gas Monitors:

- Operate in diffusion mode, with factory-calibrated sensors ready to perform immediately after installation.
- Are available for remote sensing applications, where installations require the sensor to be separated from the electronics.
- Can operate completely stand-alone with a large LCD display, optional “quick-check” LEDs and four relay outputs (three alarm and one fault), or connected with a standard 4-20mA output to a control system (PLC, DCS, etc).
- Has adjustable full-scale range
- Provide for easy installations with the two-piece, field-wiring connectors.

## Calibration

As with all gas monitors, Ultima X Series Gas Monitors must be calibrated periodically with the gas of interest to ensure proper operation. The calibration process offers:

- Easy-to-follow calibration instructions displayed on monitor
- Automatic adjustments
- Date stamping
- Selectable lockout of output signal during calibration
- Ability to calibrate at the installation location, or remotely without systems interruptions (using another base unit)
- No need to open the enclosure during set-up and calibration when using accessory calibrator, controller or pushbutton

## X Factors

### 1 Sensor Disconnect Under Power

MSA’s patented feature allows for sensor change-out without declassifying a hazardous area.

### 2 Interchangeable Smart Sensors

Pre-calibrated sensor modules are ready for installation out of the box. Sensors can be replaced in the field without the use of tools. The unit quickly recognizes the new sensor type and reconfigures alarm and relay settings to optimize the new sensor.

### 3 State-of-the-Art Display

Liquid crystal display conveniently alternates between sensor reading and gas type and features scrolling messaging, indicating ongoing diagnostic checks such as sensor "end-of-life" condition.

### 4 World-Class Design

Engineering efforts feature a single-board design for ultimate reliability and serviceability. The multiple-entry mounting enclosure has been designed to be separate from the electronics and sensor, allowing for problem-free installation and servicing.

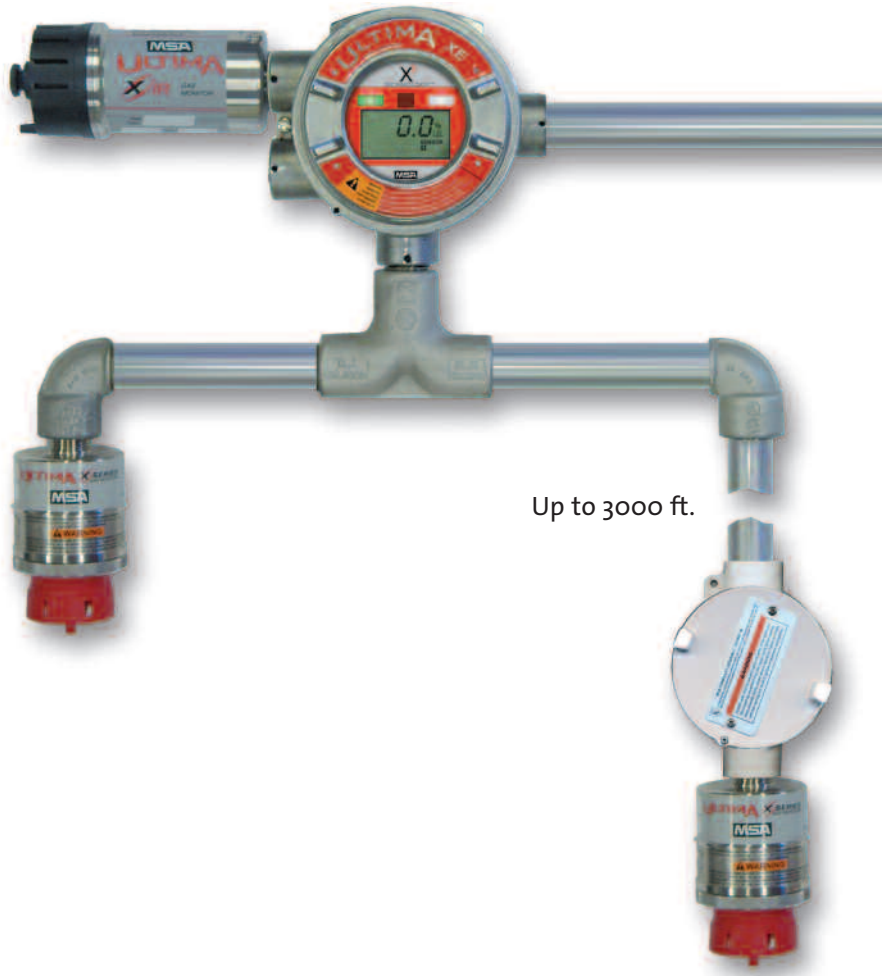
### 5 Onboard LEDs and Relays

Optional "quick-check" LEDs and four relay outputs allow for increased indication of alarm and fault conditions. “Quick-check" LEDs, viewable from afar, indicate NORMAL (green) and ALERT (red) status conditions. Field-programmable alarm levels and normally energized/de-energized, normally opened/closed and latching/non-latching relay functions offer three levels of alarm and a fault.

*With a number of new and exciting features, the Ultima X Series Gas Monitors are suitable for indoor and outdoor applications in virtually any type of industry including offshore, refineries, chemical and petrochemical facilities, steel mills, water and wastewater plants, mining, and general industry.*

# Ultima X$^3$™ Technology

## [ X to the Power of 3 ]




### PLC/DCS [ProSoft-Tested]

Connect the X$^3$ unit to PLC/DCS control systems. The X$^3$ technology is ProSoft-Certified. It has been tested and found to be compatible with Allen-Bradley PLC/ModBUS connectivity by ProSoft Technology, Inc.

**Ultima X$^3$ Technology** for the Ultima X Series Gas Monitors features:

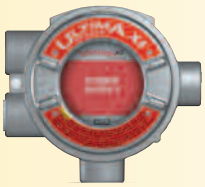
- **Multi-sensing**
  - A system can handle up to 31 monitors with up to 3 sensors inputted per monitor for a total of 93 sensors
  - Any combination of electrochemical-, catalytic-, and infrared-type sensors are available
  - Scrolling display – monitor scrolls through type and reading for all sensors attached
  - The Ultima X$^3$ Monitor operates as a slave device on the network
- **Signal boost**
  - Each sensor can be observed remotely up-to 3000ft. from the monitor
  - Universal 85-256VAC or 7-30VDC power supply available at remote condulet
- **ModBUS RTU Output**
  - Industry-standard format
  - Provides an RS-485 half-duplex communication interface
  - Integration into PLC/DCS systems

# Accessories

## Power Supply

The Ultima X external power supply can power sensors remotely. Internal power supply option is also available. One remote power supply module can power:

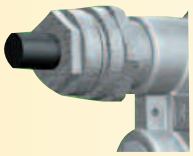
- Up to 5 electrochemical or oxygen sensors.
- Up to 3 Combustible sensors



## Pushbutton

The pushbutton allows the user to view various functions without the use of the calibrator. The pushbutton allows the user to:

- Acknowledge Alarms
- Initialize Zero Calibration
- Initialize SPAN Calibration
- Initialize iCAL Calibration
- Abort Calibration

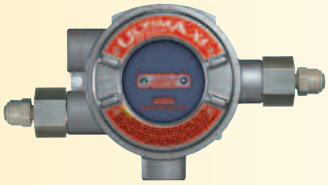


## Duct-Mount Kit

The Duct Mount Kit allows the user to monitor air within ductwork using the Ultima XE, XA or XIR sensor. A quick-disconnect fitting enables the calibration gas to reach the sensor without having to remove the duct-mounted sensor.

## Pump

Sampling pumps are available to bring a remote sample to a sensor. The sampling modules are available in GP and XP versions of aspirated and pumped modules.



## Calibrator

The Ultima Monitor Calibrator offers the industry's simplest method of calibration, an easy-to-use three button device that allows calibration and address-change of the Ultima X Series Monitor.

## Controller

The Ultima Monitor Controller provides complete access to all features through its full-function keypad. It offers the ability to set alarm levels, change span gas values and display date of last calibration.

# Ultima® X Series Gas Monitors

## [ Ultimate Features. . . EXtreme Design ]

### Ultima XE Gas Monitor – Explosion-Proof Stainless Steel Gas Detector with Display

The Ultima XE Gas Monitor offers:

- 316 Stainless steel
- Multiple-entry mounting enclosure

### Ultima XA Gas Monitor – Water- and Corrosion-Resistant, All-Purpose, Polycarbonate Gas Detector with Display

The Ultima XA Gas Monitor offers:

- Nema 4X rating
- Light-weight (Only 1.5 lbs)

### Ultima XIR Gas Monitor – Explosion-Proof Stainless Steel, Infrared Gas Detector with Display

The Ultima XIR Gas Monitor offers:

- 316 Stainless steel
- Multiple-entry mounting enclosure
- Fast response time
- Operation based on dual-wavelength, heated-optics technology, providing definitive compensation for temperature, humidity and aging effects
- IR technology which offers excellent long-term stability, eliminating the need for frequent calibrations
- A sintered-disk-free design for optimum performance in harsh environments
- No-gas calibration. A zero adjustment is all that is required for full calibration.
- IP67 Rated – protected from temporary immersion in water

## Gases

Acetylene IR- 0-2.5%
Ammonia- 0-50 PPM
Ammonia- 0-100 PPM
Ammonia- 0-1000 PPM
Arsine- 0-2 PPM
Bromine- 0-5 PPM
Carbon Dioxide IR- 0-0.5%
Carbon Dioxide IR- 0-2%
Carbon Dioxide IR- 0-5%
Carbon Monoxide- 0-100 PPM
Carbon Monoxide- 0-500 PPM
Carbon Monoxide- 0-1000 PPM
Chlorine- 0-5 PPM
Chlorine- 0-10 PPM
Chlorine- 0-20 PPM
Chlorine Dioxide- 0-3 PPM
IR Combustible Gas - Methane- 0-100% LEL
IR Combustible Gas - Non Methane- 0-100% LEL
Combustible Gas- 0-100% LEL Natural Gas and H2
Combustible Gas- 0-100% LEL Petroleum Vapors
Combustible Gas- 0-100% Solvents
Diborane- 0-50 PPM
ETO- 0-10 PPM
Flourine- 0-5 PPM
Germane- 0-3 PPM
HF- 0-10 PPM
Hydrogen- 0-1000 PPM
Hydrogen Chloride- 0-50 PPM
Hydrogen Cyanide- 0-50 PPM
Hydrogen Sulfide- 0-10 PPM
Hydrogen Sulfide- 0-50 PPM
Hydrogen Sulfide- 0-100 PPM
Hydrogen Sulfide- 0-500 PPM
Hydrogen Sulfide - solid state- 0-100 PPM
Nitric Oxide- 0-100 PPM
Nitrogen Dioxide- 0-10 PPM
Oxygen- 0-10% - compensated
Oxygen- 0-25% - compensated
Oxygen - $CO_2$ Tolerant- 0-25%
Oxygen - Solvent Tolerant- 0-25%
Phosgene- 0-1%
Phosphine- 0-2 PPM
Silane- 0-25 PPM
Sulfur Dioxide- 0-25 PPM
Sulfur Dioxide- 0-100 PPM

## Specifications (for Ultima XE, Ultima XA and Ultima XIR)

| | | |
|---|---|---|
| **Gas Types** | XE, XA | Combustibles, oxygen and toxics |
| | XIR | Combustibles; 0-100%LEL |
| **Temperature Range** | | -40°C to +60°C (-40°F to +140°F) (Typical-range for some gases may differ) |
| **Drift** | | |
| Zero Drift | XE, XA | <5%/year, typical |
| | XIR | ±2%/year, typical |
| Span Drift | XE, XA | <10%/year, typical |
| **Noise** | | <1% Full Scale |
| **Accuracy** | | |
| Repeatability | XE, XA, XIR | ±1%Full Scale or 2ppm, typical |
| Linearity | XE, XA | ±2%Full Scale or 2ppm, ($O_2$, CO) |
| | XIR | ±2%Full Scale (≤50% LEL) |
| | XE, XA | ±3%Full Scale (<50% LEL combustibles) |
| | XE, XA, XIR | ±5%Full Scale (>50% LEL combustibles) |
| | XE, XA | ±10%Full Scale or 2ppm, (non-CO toxics) |
| **Response Times** | | |
| T20 $O_2$ & toxics | XE, XA | <12 seconds (typically 6 seconds) |
| T50 $O_2$ & toxics | XE, XA | <30 seconds (typically 12 seconds) |
| T50 combust. | XE, XA | <8 seconds |
| T90 combust. | XE, XA | <30 seconds |
| T90 combust. | XIR | <2 seconds |
| **Humidity** | XE, XA | 15%-95% RH, non-condensing |
| | XIR | 0%-95% RH, non-condensing |
| **Sensor Life** | | |
| Oxygen & Toxics | XE, XA | 2 years typical |
| Combust. | XE, XA | 3 years typical |
| Combust. | XIR | 5 years typical |
| Warranty | | 1 year XE, XA; 2 years XIR |
| **Power Input** | XE, XA | 7-30VDC (oxygen and toxics) |
| | XE, XA | 7-30VDC @ 450mA maximum (combustibles) |
| | XIR | 7-30VDC @ 750mA maximum (combustibles) |
| **Wiring Requirements** | | |
| Combust. | XE, XA, XIR | 3-wire |
| Oxygen & Toxics | XE, XA | 2-wire; no LEDs or relays |
| Oxygen & Toxics | XE, XA | 3-wire; LEDs and/or relays |
| **Signal Output** | XE, XA | 4-20mA 2-wire current sink |
| | XE, XA, XIR | 4-20mA 3-wire current source |
| **Relay Contact Rating** | | 5amp @ 220 VAC; 5amp @ 30 VDC |
| **Housing Entries** | XE, XIR | Four conduit entries, 3/4" NPT or 25mm |
| | XA | One Entry |
| **Physical** | XE | 316 Stainless Steel; 10.4lbs (4.7kg) 6.3"W x 3.9"D x 10.3"L (160 x 99 x 261mm) |
| | XA | Polycarbonate; 1.5lbs (0.68kg) 5.1"W x 2.9"D x 9.4"L (130 x 76 x 239mm) |
| | XIR | 316 Stainless Steel; 10.8lbs (4.9kg) 12.6"W x 3.9"D x 5.7"L (320 x 99 x 144mm) |
| **Approval Ratings** | XE | UL 1203 & |
| | | CSA C22.2-30 Class I, Div. 1, Groups A, B, C, & D |
| | | CSA C22.2 No. 152 Class I, Div. 1, Groups A, B, C, & D |
| | XA | Nema 4X rating |
| | XIR | UL 1203 & |
| | | CSA C22.2-30 Class I, Div. 1, Groups A, B, C, & D; Class II, Div.1, Groups E, F, & G; Class III |
| | | CSA C22.2 No. 152 Class I, Div. 1, Groups B, C, & D |
| | XE & XIR | EN 50014 & |
| | | EN 50018 Class I, Zone 1, Group IIC |
| | XE, XA, XIR | CE Low Voltage Directive: 73/23/EEC |
| | | CE EMC Directive: 89/336/EEC |

**Note:** This Data Sheet contains only a general description of the product shown. While uses and performance capabilities are described, under no circumstances should the product be used except by qualified, trained personnel, and not until the instructions, labels or other literature accompanying the product have been carefully read and understood and the precautions therein set forth followed. Only they contain the complete and detailed information concerning this product.

DS 07-2051
(L) Oct 2004


Instrument Division:
P.O. Box 427, Pittsburgh
PA 15230 U.S.A.
www.MSAgasdetection.com

In U.S.:
Phone: 1-800-MSA-INST
Fax: 1-724-776-3280

In Canada:
Phone: 1-800-MSA-INST
Fax: 1-905-238-4151

In Mexico:
Phone: 52 55 21 22 5770
Fax: 52 (5) 3 59 43 30

MSA International:
Phone: 412-967-3228
Fax: 412-967-3373

Offices and representatives worldwide
For further information: